

22770

IN THE U.S. PATENT AND TRADEMARK OFFICE

Inventor James J. WANG et al Patent App.

10/791,326

Filed 2 March 2004 Conf. No. 1809

For TOPICAL COSMETIC COMPOSITION CONTAINING HYBRID  
SILICONE CO

Art Unit

1615 Examiner Helm, C

Hon. Commissioner of Patents Box

1450 Alexandria, VA 22313-1450

DECLARATION UNDER 37 CFR 1.132

I, Dr. James J. Wang, a citizen of the United States,  
residing at 149 San Juan Avenue, Albertson, NY 11507, declare as follows:

THAT I am the same Dr. James J. Wang who executed a  
Declaration Under 37 CFR 1.132 on 15 December 2008 and filed in  
this application on 6 January 2009;

THAT I am aware that the Examiner in the office action  
mailed 5 August 2009 has newly cited and applied the Shin-Etsu  
Silicones for Personal Care, Product Brochure KSP Series (2000), in  
combination with European Patent Application 0 315 836 A2 to  
FINBERG, US Patent 5,115,020 to MURAMOTO et al, and US Patent

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5,173,290 to HALLORAN et al, against the claims directed to the present invention, arguing the obviousness of our hybrid silicone

composite powder having a spherical shape with a particle diameter ranging from 2 to 10  $\mu$ m, as an ingredient for a cosmetic applied to the skin, to impart a smooth feeling when the cosmetic is applied

to the skin, comprising polydimethylsiloxane (PMS) and polymethylsilsesquioxane (PMSQ) networks, wherein the PMS and PMSQ networks form a composite structure of two interpenetrating polymer networks (IPNs) in which the PMS and PMSQ networks are held together by physical entanglements on a molecular scale without

chemical bonding between them;

THAT the Examiner has applied the Shin-Etsu Silicones for Personal Care, Product Brochure KSP Series (2000), in particular, to show that spherical silicone powders composed of PMS and PMSQ of a particle size of 2 to 10  $\mu$ m are known in the art for use in cosmetic compositions, are taught to swell in a silicone fluid, and are taught to impart a smooth silky feel to cosmetic compositions;

THAT in order to establish that the compositions according to the present invention which do contain both PMS and PMSQ as interpenetrating polymer networks and the compositions of the Shin-Etsu Silicones KSP Series, which do not contain either a PMS or a PMSQ interpenetrating polymer network, have surprisingly

superior properties, I have either personally conducted or supervised the carrying out of the following tests:

#### T E S T S

KSP-100, disclosed on page 3 of the KSP Series, is a spherical silicone powder (PMS) with its surface being treated by PMSQ through chemical bonding. After surface treatment, the silicone powder has less agglomeration and is easy to disperse, but its oil Absorption and swelling are shattered.

Gransil EPSQ (IPN spherical powder of PMS and PMSQ according to the present invention) is the trademark of the composition that is our present invention, which has no chemical bonding between Gransil PSQ and silicone powder (PMS). Its molecular structure is IPN type (not only on surface) of spherical powder. This powder is more elastic, sponge-like, and its oil Absorption and swelling are even significantly increased after being engineered IPN structure.

While both KSP-100 and Gransil EPSQ share the same components in the structure, they are totally different materials with differing structures and physical properties.

KSP-100, INCI name: Vinylmethicone/methiconesilsesquioxane

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Crosspolymer

It appears like individual solid sphere beads, feels slippery and solid, and has very weak oil absorption.

Gransil EPSQ, INCI name:

Dimethicone/Divinyldimethicone/Silsesquioxane Crosspolymer

It appears like sponge powder cake, feels soft and elastic and has super high oil absorption and thickening power.

KSP-100 has a core-shell structure, i.e., PMS being the core and PMSQ the shell. The core is made first, and then the surface is further modified with PMSQ via chemical bonding. Consequently, the PMS elastic core is wrapped with the plastic PMSQ shell, resulting in higher slip feel (more like PMSQ particle feel) and ease of dispersing in oil, but significantly reduced oil absorption. The advantage of ease of dispersing was achieved at huge expense of oil absorption and thickening capacity.

On the other hand, Gransil EPSQ has a loose IPN structure (not a core-shell structure), i.e., PMS and PMSQ are intertwined into networks throughout the particle. Its network is more elastic and random due to the interruption of another different kind of molecular chain segment and therefore its pore size and void distribution are more favorable for oil absorption and swelling.

Compared to the KSP-100 particles, Gransil EPSQ has demonstrated 6000 times oil thickening efficiency. See Formula 1 and 2 in the Table herein below.

Compared to PMS particles, Gransil EPSQ has demonstrated 1000 times oil thickening efficiency. See Formula 2 and 3 in the Table.

Compared to PMS and PMSQ, KSP-100's thickening efficiency is between that of PMS and PMSQ, and closer to that of PMSQ. See Formula 1, 3 and 4 in the Table.

Compared to the physical blend of PMS and PMSQ, Gransil EPSQ has a demonstrated 2770 times oil thickening efficiency. See Formula 2 and 5 in the Table. Table Viscosity Comparison At 13% of Powder in Cyclopentasiloxane Fluid

	Formula	Formula 2	Formula 3	Formula 4	Formula 5
Gransil EPSQ		24.0			
Gransil EPLS			24.0		21.6
Gransil PSQ				24.0	2.4
DC 245	160.0	160.0	160.0	160.0	160.0
KSP-100	24.0				
Viscosity, cPs	90	568,000	402	11	205

Note:

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DC 245 = Cyclopentasiloxane fluid, viscosity = 4.0 cSt, (Dow Corning Corp.) Gransil EPSQ = IPN spherical powder of PMS and PMSQ of present invention (Grant Industries, Inc.)

Gransil EPLS = PMS elastomer powder (Grant Industries, Inc.) Gransil PSQ = PMSQ spherical powder (Grant Industries, Inc.) Viscosity is measured on Brookfield Viscometer Model DV-I+ at room temperature.

THAT based upon the data presented above, I conclude the following:

1. KSP-100 is a chemically bonded hybrid spherical particle.

Its properties are closer to those of PMSQ rather than to those of PMS. Its major function is similar to PMSQ as a slip aid, and as an anti-caking and anti-grease additive.

2. Gransil EPSQ of the present invention is a non-chemically bonded IPN hybrid spherical particle. Its properties are closer to those of PMS rather than to those of PMSQ, but surprisingly and drastically surpass PMS in oil absorption and thickening power.

Its major function is as an oil absorption and thickening agent to make gels delivering a soft and smooth feel.

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3. KSP-100 and Gransil EPSQ, even though they both contain PMS and PMSQ, are not equivalent to one another because they are structurally different materials and have different functions.

Their difference in molecular structure is responsible for their different physical properties and functions, in particular the surprisingly huge difference in oil absorption and thickening power.

4. At the time of our invention of the novel IPNs of PMS and PMSQ, held together by physical means without chemical bonding, no one knew what an IPN spherical particle of PMS and PMSQ would even look like and what physical or chemical properties it might have.

THAT in addition to the comparative data presented above, to distinguish the presently claimed compositions over the compositions disclosed in the KSP reference, I wish to comment on US Patent 5,115,020 to MURAMOTO et al: This patent does not teach the IPN material of our invention for the reasons below:

1. Muramoto et al disclose a semi-IPN particle material in which a liner, non-cross linked polymer is IMbedded in a crosslinked polymer network. Such a semi-IPN particle differs from IPN spherical particle of our invention because the linear polymer

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imbedded in semi-IPN particle is not permanently "locked" within the network and will consequently be extracted out when mixed in a solvent as in the case of cosmetic formulations. More specifically the linear, non-cross-linked polymers, such as polybutadiene, in the semi-IPN structure will be extracted out from the crosslinked polymer network if the semi-IPN material is mixed in a cyclic silicone fluid (e.g. DC 245) or mineral paraffin oil because linear polybutadiene and the other linear non-crosslinked polymers mentioned in MURAMOTO et al are soluble in those cosmetic oils.

2. The IPN particles disclosed in MURAMOTO et al are not spherical.

According to Example 6, the inventors had to add potassium chloride to effect aggregation to be Able to separate from water.

MURAMOTO et al did not even mention that their method was intended to make well-defined SPHERICAL particles. Non-spherical particles are rough on skin so they are not generally accepted for cosmetic products, and therefore they have little use value for cosmetic.

To make a spherical particle, the polymerizable oil droplets must not experience aggregation throughout the process. The fact is that MURAMOTO et al described their particles to be in aggregated form in Example 6 is itself evidence that the particles are not spherical. It is well known that all aggregates of particles do not have spherical shape and one cannot even break such aggregates into individual particles later on.



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3. Neither the crosslinked polymer network nor the linear, non-crosslinked polymer imbedded in the crosslinked polymer network disclosed in MURAMOTO et al are structurally similar to either PMS or PMSQ.

4. THAT I am aware of no data inconsistent with those presented above or which would lead one to a contrary conclusion; and

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine, or Imprisonment, or both, under 18 USC 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

9/24/09

Date

  
Dr. James J. Wang

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